U.S.C. 374 with the publication of a related P.C.T. Request filed on August 3, 2000.

All of the claims presently before the examiner are believed to be allowable over the prior art of record. New claims 29, 35-37 and 45 also further distinguish the present invention over the prior art of record with additional limitations, and in particular U.S. Patent 4,317,685 to Ahuja et al., issued March 2, 1982 (hereinafter "Ahuja"), previously cited in a Supplemental Information Disclosure Statement filed January 17th, 2000. Ahuja teaches a method for removing scale from a surface of a high temperature alloy employing a heated aqueous alkaline hydroxide solution in an autoclave in a non-oxidizing atmosphere. See Ahuja at the Abstract. The non-oxidizing atmosphere is required and is an important feature of the invention taught by Ahuja. See Ahuja at Column 4 lines 19-22. Both of Ahuja's claims require a non-oxidizing atmosphere. See Ahuja at Column 4 line 65 through Column 6.

The method and structure described by the present claims is not limited to a non-oxidizing atmosphere. See independent structure claim 1 and method claim 11. Additionally, new claim 29 claims a method of treating scale on the surface of a metal object with the positive recitation of performing the treatment "in an oxidizing atmosphere." Similarly, new claim 35 claims a system for conditioning scale on the surface of a metal object comprising the engaging of a metal object with an atomized treatment mixture in an oxidizing atmosphere. New claims 36, 37 and 45 are directly and indirectly dependent upon new claim 35, and therefore include the same limitations.

Respectfully submitted,

Date: April 3, 2000

Patrick J. Daugherty, Esq. (Reg. No. 41,697)
Driggs, Lucas, Brubaker & Hogg Co., L.P.A.

PJD:cg
Enclosure

KOL-10-5310

COPY

NEW CLAIMS 29 – 45

(Application Serial No. 09/469,687 – Docket KOL-10-5310)

29. (New) The method of claim 11 wherein the step of spraying said solution on the surface of the metal object is performed in an oxidizing atmosphere.

30. (New) The system of claim 4 wherein:

a) the metal object has a composition and dimensions; and

b) the control mechanism flow control devices control said flow responsive to at least one of the group consisting of the composition and the dimensions of said metal object.

31. (New) The system of claim 10, wherein:

a) the metal object has a composition and dimensions; and

b) the control mechanism flow control devices control said flow responsive to at least one of the group consisting of the composition and the dimensions of said metal object.

32. (New) A system for conditioning scale on the surface of a metal object comprising:

a first reservoir containing an aqueous caustic solution;

a second reservoir containing a second liquid solution;

at least one nozzle communicating with said first and second reservoirs and adapted to spray an atomized mist of a treatment mixture of said aqueous caustic solution and said second liquid solution and thereby cause the treatment mixture to engage the surface of the metal object, said treatment mixture having a concentration of the aqueous caustic solution and a concentration of the second liquid solution;

a driving mechanism positioned to move the metal object at a rate relative to said at least one nozzle and thereby passing said at least one nozzle; and

a control mechanism in communication with said at least one nozzle, the control mechanism configured to control the flow rate of said treatment mixture through said at least one nozzle as an atomized mist engaging said metal object surface .

33. (New) The system of claim 32, wherein the metal object has a surface temperature, further comprising:

a temperature-sensing device in communication with said control mechanism and positioned to sense the surface temperature of said metal object prior to the metal object passing said at least one nozzle;

a temperature control system in responsive communication with said control mechanism and positioned to increase or decrease the temperature of said metal object prior to the metal object passing said at least one nozzle;

wherein said control mechanism directs the temperature control system to increase or decrease the surface temperature of said metal object prior to the metal object surface engaging said atomized treatment mist responsive to the temperature-sensing device.

34. (New) The system of claim 33, wherein the atomized treatment mixture comprises at least one salt having a melting point, and wherein the control mechanism is configured to direct the temperature control system to increase or decrease the surface temperature of said metal object prior to the metal object surface engaging said atomized treatment mist to a temperature above said salt melting point and below the temperature at which the Leidenfrost effect appears on said metal object surface.

35. (New) The system of claim 34 wherein the atomized treatment mixture mist engages the surface of the metal object in an oxidizing atmosphere.

36 (New) The system of claim 35, further comprising a surface analyzer in communication with said control mechanism and positioned to measure a degree of surface conditioning of said metal object surface after said surface has been engaged by said atomized treatment mist, wherein the control mechanism is further configured to control the flow rate of said treatment mixture through said at least one nozzle responsive to the degree of surface conditioning measured by the surface analyzer.

37 (New) The system of claim 36, further comprising a speed sensing device in communication with said control mechanism and positioned to measure the rate at which said metal object surface passes said at least one nozzle, wherein the control mechanism is further configured to control the flow rate of said treatment mixture through said at least one nozzle responsive to the speed sensing device.

38. (New) The system of claim 32, further comprising:

a flow monitor in series with the at least one nozzle configured to monitor the flow of the treatment mixture through said nozzle, said monitor communicating with the control mechanism; and

at least a second nozzle in communication with said control mechanism and said first and second reservoirs and adapted to spray an atomized mist of a treatment mixture of said aqueous caustic solution and said second liquid solution and thereby cause the treatment mixture to engage the surface of the metal object;

wherein said control mechanism operates said second nozzle responsive to said flow monitor.

39. (New) The system of claim 38 wherein the control mechanism is furthered configured to operate said second nozzle responsive to the degree of surface conditioning measured by the surface analyzer.

40. (New) The system of claim 5 further comprising a surface condition analyzer in communication with said control mechanism and positioned to measure a degree of surface conditioning of said metal strip after said strip has been engaged by the spray droplets, wherein the control mechanism is further configured to control a flow rate of said aqueous caustic solution through said at least one nozzle responsive to the degree of surface conditioning measured by the surface analyzer.

41. (New) The method of claim 11, further comprising the steps of:

a) providing a composition and dimensions for the metal object; and

b) controlling the amount of the solution sprayed on the surface of the metal object;

wherein the step of controlling the amount of the solution sprayed is responsive to at least one of the composition and the dimensions of the metal object.

42. (New) The method of claim41, further comprising the step of analyzing the sprayed metal object surface to measure a degree of surface conditioning of said metal object surface; and wherein the step of controlling the amount of the solution sprayed is further responsive to the step of analyzing said sprayed metal object surface.

43. (New) The system of Claim 8 further comprising a heating mechanism disposed to heat the surface of the metal object prior to the metal object passing said temperature-sensing device to a temperature above the melting point of the composition contained in the aqueous solution.

44. (New) The system of claim 32, wherein the metal object has a composition, and wherein the control mechanism is further configured to vary the concentration of said first aqueous caustic solution and vary the concentration of the second liquid solution within said treatment mixture responsive to the composition of said metal object.

45. (New) The system of claim 36, wherein the metal object has a composition and dimensions, and wherein the control mechanism is further configured to vary the concentration of said first aqueous caustic solution and vary the concentration of the second liquid solution within said treatment mixture responsive to at least one of the group consisting of the composition of said metal object, the dimensions of said metal object, and the degree of surface conditioning measured by the surface analyzer.